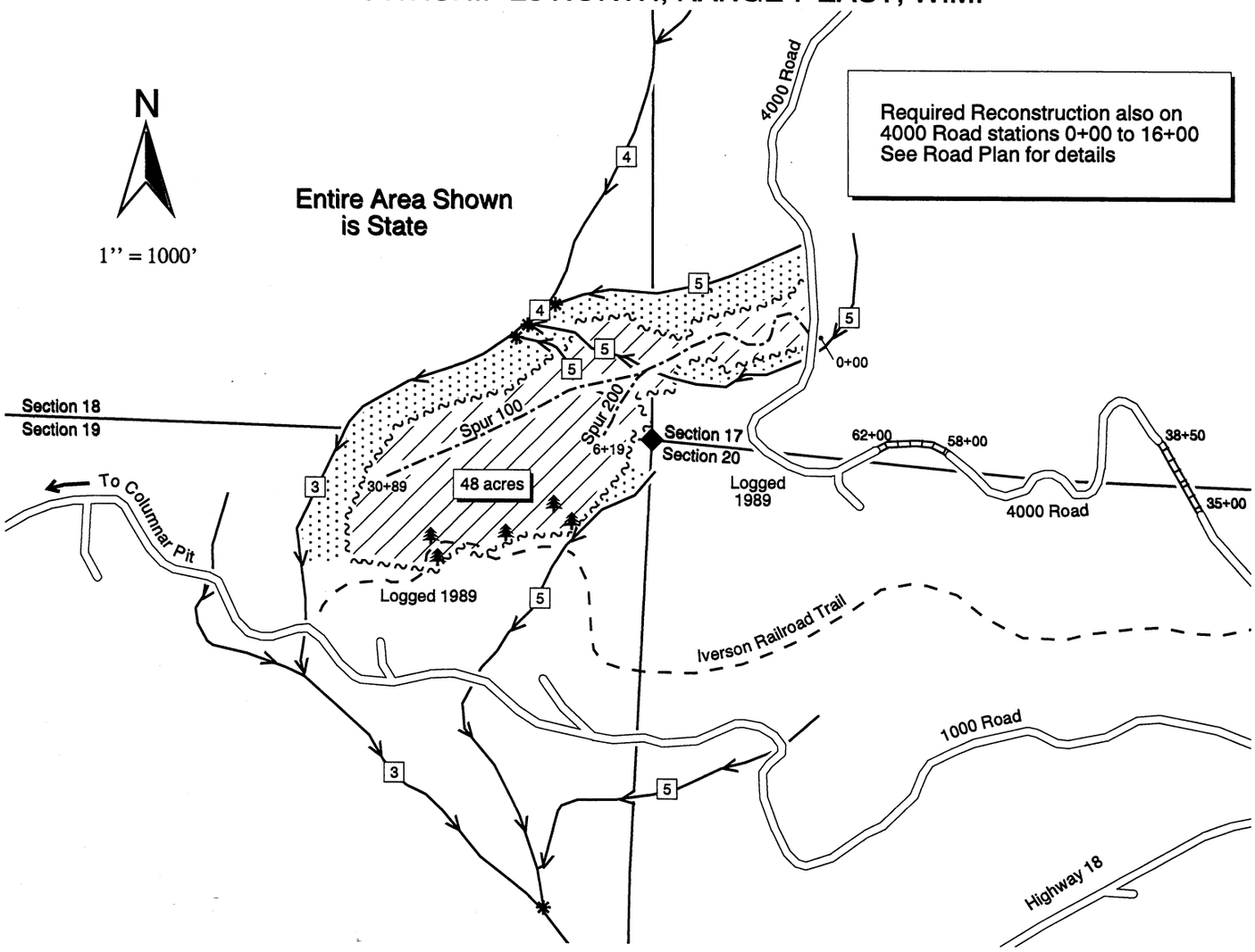
TIMBER SALE MAP

SALE NAME: ULALA
AGREEMENT NO: 30-076003
TRUST(S): FOREST BOARD TRANSFER

REGION: SOUTH PUGET SOUND
COUNTY(S): KING

ROAD PLAN PROJECT MAP
TOWNSHIP 23 NORTH, RANGE 7 EAST, W.M.



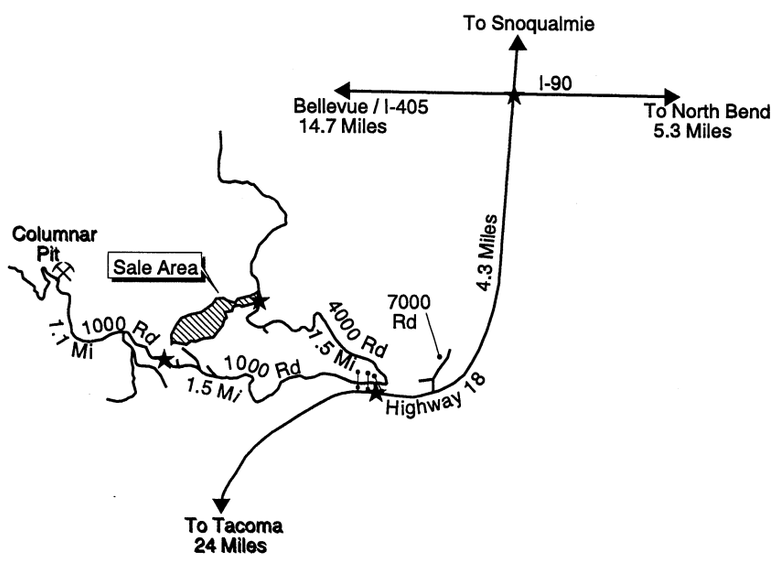
ELEVATION RANGE: 1,500 to 2,000 feet

LEGEND

- White Timber Sale Boundary Tags
- Leave areas marked by Yellow Leave Tree Area Tags
- Sale Area: Slopes <30% Ground Based, slopes >30% Cable
- RMZ
- Existing Road
- Required Reconstruction
- Optional Construction
- Survey Corner
- Water Break
- 3 Water Type
- Streams
- Recreation Trail
- Locked Gate: Combo 6003

Drawn By: A. Stuart
Date: June 3, 2004

VICINITY MAP
Not to Scale



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

ULALA

ROAD PLAN

SECTIONS 17,18,19,20, TOWNSHIP 23 NORTH, RANGE 07 EAST, W.M.
KING COUNTY

KING DISTRICT

AGREEMENT NO.: 30-076003 STAFF ENGINEER: A. MCDONALD

DATE: 6 /1/2004 DRAWN & COMPILED BY: A. MCDONALD

SECTION 0 - SCOPE OF PROJECT

This project includes but is not limited to optional construction including:

clearing;
grubbing;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition, manufacture, and application of rock;
road abandonment.

This project also includes but is not limited to reconstruction including:

acquisition and application of rock;
compaction of road surface.

SECTION 1 - GENERAL CLAUSES

1.1-1 **ROAD PLAN SCOPE**

Clauses in this plan apply to all construction, reconstruction or abandonment including landings unless otherwise noted.

1.1-2 **REQUIRED ROADS**

Reconstruction of the following roads is required. All roads shall be reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
4000	0+00 to 16+00	Reconstruction
4000	35+00 to 38+50	Reconstruction
4000	58+00 to 62+00	Reconstruction

1.1-2C **UNDERGROUND UTILITIES**

Road construction and reconstruction is in close proximity to buried utilities. All work shall be done in accordance with RCW 19.122, Underground Utilities. Purchaser is responsible for all notification and liabilities associated with the buried utilities and its right-of-way.

1.1-3 **OPTIONAL ROADS**

Construction of the following roads is not required. Roads used by the Purchaser shall be constructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
Spur 100	0+00 to 30+89	Construction
Spur 200	0+00 to 6+19	Construction

1.1-4 **ROAD PLAN CHANGES**

Any departure from this Road Plan including relocation, extension, change in design or additional roads shall be submitted in writing, to the Contract Administrator for consideration. Submitted plans must be approved before construction begins.

1.1-5 **HIDDEN CONDITIONS**

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.2-1 **CONSTRUCTION PERIOD**

The construction, reconstruction or rock haul on any of the roads specified herein shall not be permitted when in the opinion of the Contract Administrator, excessive damage may occur, nor shall it be permitted from November 1 to May 31 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-1C **DAILY CONSTRUCTION TIME**

Operation of construction equipment will not be permitted from 6:00 PM to 6:00 AM, Monday through Friday. No operation of road construction equipment will be allowed on weekends or State recognized holidays unless authority to do so is granted in writing by the Contract Administrator.

1.2-2 **HAUL APPROVAL**

Purchaser shall not use roads constructed or reconstructed under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-3 **EXCAVATOR CONSTRUCTION**

Roads shall be constructed using track mounted hydraulic excavators unless otherwise authorized, in writing, by the Contract Administrator.

1.2.1-1 **CONSTRUCTION STEPS**

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator. Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the clearing limits, or restrict drainage.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application, and/or timber haul.

1.3-1A **CLOSURE TO PREVENT ROAD DAMAGE**

At any time of the year, the hauling of forest products shall not be permitted when in the opinion of the Contract Administrator excessive road damage may occur.

1.4-3 **R P DAMAGE**

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1 **ROAD MAINTENANCE RESPONSIBILITY**

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

SECTION 2 - CLEARING

2.1-1 **CLEARING SPECIFICATION**

Fell all vegetative material larger than 6 inches DBH or over 20 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1 **GRUBBING SPECIFICATIONS**

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET.

3-2 **GRUBBING LIMITS**

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1 **DEBRIS DEFINITION**

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume ungrubbed within the grubbing limits.

4.1-2 **DISPOSAL COMPLETION**

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-3 **DEBRIS PLACEMENT**

Right-of-way debris shall not be placed against standing timber.

4.2.3-4 **SCATTERING RIGHT OF WAY DEBRIS**

Right-of-way debris shall be scattered outside the grubbing limits.

SECTION 5 - EXCAVATION

5.1-1 **DEFAULT ROAD DIMENSIONS**

Roads shall be constructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3 **ROAD GRADE AND ALIGNMENT**

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are as specified on drawings. Minimum radius curve is 60 feet.

5.1-4 **CURVE WIDENING**

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

Curve widening, where required, shall be added to the inside of curves.

5.1-7 **CONSTRUCTION TOLERANCES**

Roads shall be constructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8 **CUT SLOPE RATIO**

Excavation (cut) slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio	Percent
Common Earth (on side slopes less than 55%)	1:1	100
Common Earth (55% to 70% sideslopes)	3/4:1	133
Common Earth (on slopes over 70%)	1/2:1	200
Fractured or loose rock	1/2:1	200
Hardpan or solid rock	1/4:1	300

5.1-9 **SHAPING CUT SLOPE**

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10 **FILL WIDENING**

Embankments shall be widened as follows:

Height at Shoulder	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11 **FILL SLOPE RATIO**

Embankment (fill) slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio	Percent
Common Earth and Rounded Gravel	1 1/2:1	67
Angular Rock	1 1/4:1	80
Sandy Soils	2:1	50

5.1-12 **DISPOSAL OF ORGANIC DEBRIS**

Organic material shall be excluded from embankment deposited on slopes in excess of 40 percent.

5.1-22 **PROHIBITED DISPOSAL AREAS**

Waste material shall not be deposited within 100 feet of a culvert installation, live stream, Riparian Management Zone, wetland or Wetland Management Zone.

5.1-25 **TURNAROUNDS**

Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.

5.3-1 **FILL COMPACTION**

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.5-5 **SUBGRADE CROWN**

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1A **TEMPORARY CULVERTS**

Purchaser shall furnish, install and maintain temporary culverts of the length and diameter specified on the CULVERT LIST. Culverts may be new or used steel, plastic, concrete, or such other material as approved by the Contract Administrator. All said culverts shall be removed from the road bed and State Land as indicated in clause 10.1-1A.

6.2.2.1-1 **CULVERT SPECIFICATIONS**

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION.

6.2.2.3-1 **CROSS DRAIN SKEW**

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2 **CULVERT SLOPE**

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1 **ENERGY DISSIPATORS**

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1 **DITCH CONSTRUCTION**

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-2 **DITCH, HEADWALL, AND CATCHBASIN CONSTRUCTION**

Shaping the ditchline, culvert headwalls, and catch basins shall be completed prior to application of rock and/or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and Standard Details CULVERT AND DRAINAGE SPECIFICATION DETAIL.

6.5-1 **HEADWALLS**

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-1 **ROCK SOURCES**

Rock for construction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State and subject to written approval by the Contract Administrator. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

Source	Location	Type
Columnar Pit	NW ¼ of the NW ¼, SEC 19 T23N R07E	6" minus/Pit Run

7.1-1C **COMMERCIAL SOURCE**

Rock for construction or reconstruction under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

7.2.1-4 **ROCK QUALITY**

"1 ¼ INCH MINUS CRUSHED" and "6 INCH MINUS/PIT RUN" rock shall meet the following specifications for gradation and quality when placed in hauling vehicles. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator:

7.2.1.1-3

1 1/4 INCH MINUS CRUSHED ROCK

% passing 1 1/4" square sieve	100%
% passing 5/8" square sieve	70 - 90%
% passing 1/2" square sieve	50 - 80%
% passing 1/4" square sieve	30 - 50%
% passing U.S. #40 sieve	3 - 18%
% passing U.S. #200 sieve	7.5% Max

All percentages are by weight.
The portion of ballast retained on 1/4 inch sieve shall not contain more than 0.1 percent vegetative debris or trash.

Rock shall meet Washington State Department of Transportation 2002 Standard Specifications for Road, Bridge, and Municipal Construction, Section 9-03.9(1) (Aggregates for Ballast and Crushed Surfacing-Ballast).

7.2.1.1-7A

6 INCH MINUS/PIT RUN ROCK

% equal to, or smaller in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max
% passing U.S. #200 sieve	5% Max

All percentages are by weight.
The portion of ballast retained on 1/4-inch sieve shall not contain more than 0.1 percent vegetative debris or trash.

7.4.2-1 **MINIMUM ROCK**

Apply at least the minimum required rock quantity as shown on ROCK LIST.

7.4.2-2 **SUBGRADE APPROVAL FOR ROCK**

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-7 **ROCK FOR WIDENING**

Turnarounds, Turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-8 **ROCK SHAPING**

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.2-9 **SPOT ROCK**

Purchaser shall apply rock as directed by the Contract Administrator in accordance with quantities shown on ROCK LIST.

7.4.3-2 **ROCK COMPACTION**

Rock shall be spread and compacted full width in one lift not to exceed 12 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 20,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

SECTION 8 - STRUCTURES

8.1-1 **SIGNS**

The Purchaser shall be responsible for the <purchase> <and> installation of the following road signs. <Signs shall comply with the U.S. Department of Transportation, Federal Highway Administration's "Standard Highway Signs" manual.>

Road	Station	Sign
4000	0+00	Caution Truck Traffic
1000	0+00	Caution Truck Traffic

8.4-8 **GATE CLOSURE**

During periods of hauling, Purchaser shall keep gates closed except for passing vehicles. Gates shall be closed and locked when no operation is in progress.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1 **LANDING DEBRIS**

Purchaser shall reduce or relocate debris generated by road and landing construction, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2 **LANDING DRAINAGE**

Purchaser shall provide for drainage of the landing surface as approved by the Contract Administrator.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1 **ABANDONMENT**

If constructed the following roads shall be abandoned by the Purchaser prior to the termination of this contract.

Road	Stations	Type
Spur 100	0+00 to 30+89	Light
Spur 200	0+00 to 6+19	Light

10.1-1A **LIGHT ABANDONMENT**

Light Abandonment shall consist of:

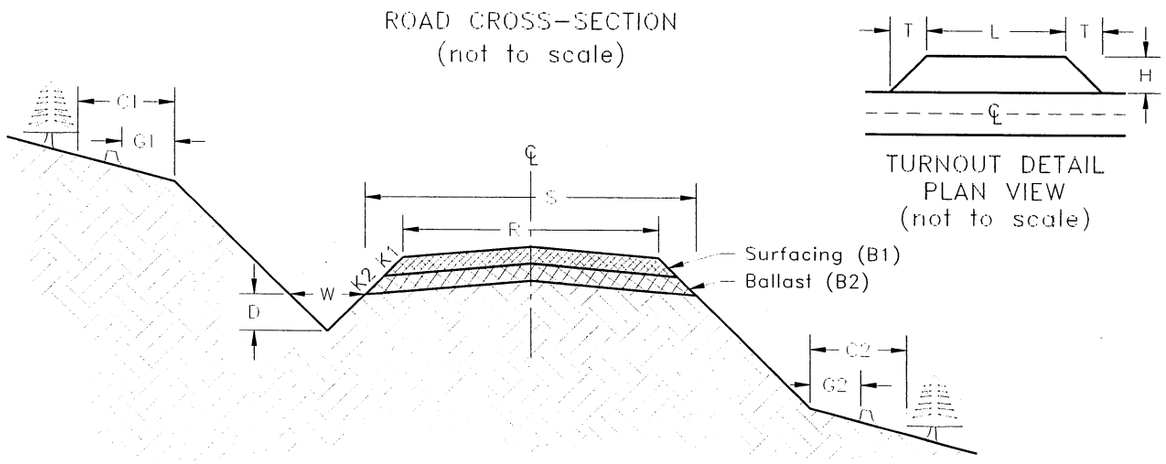
constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet;
skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
keying water bars into ditchline;
construction of a barrier to on-highway vehicles using stumps at least 22 inches in diameter at the beginning of Spur 100;
scattering of logging slash across the road prism for the first 200 feet of Spur 100;
removing ditch cross drain culverts and leaving the resulting trench open;
sloping all trench walls and approach embankments no steeper than 1 1/2:1;
removing culverts from State Land;
covering, concurrently with abandonment, all exposed soils within 100 feet of any live stream, with a 3 inch deep layer of straw.
all work shall be completed as directed by the Contract Administrator.

10.1-3 **CULVERT REMOVAL**

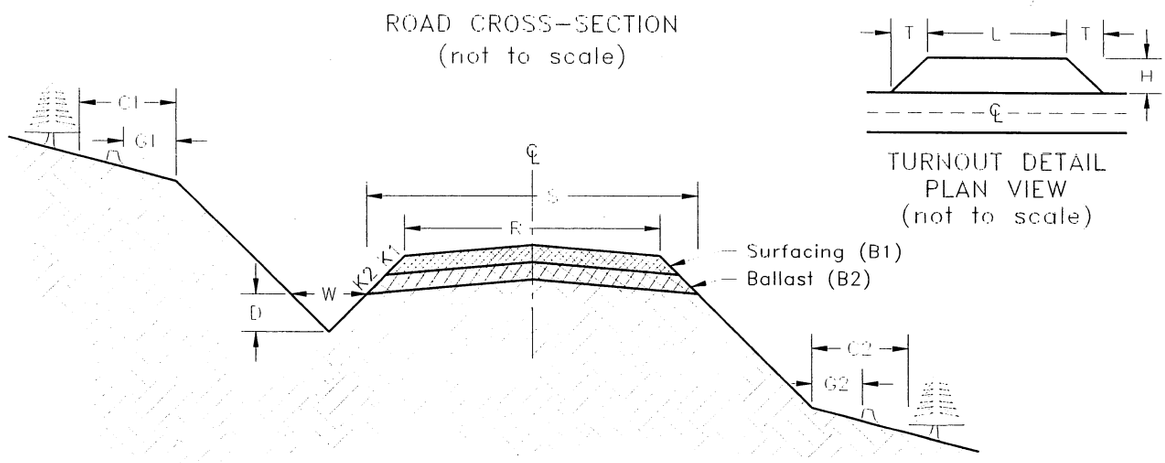
On the following road, Purchaser shall remove the temporary culvert and leave the resulting trench open with excavation slopes of 2:1. The trench bottom shall have a minimum width of 10 feet or conform to natural ground. Excavated material shall be placed in a waste area designated by the Contract Administrator.

Road	Stations
Spur 100	14+22

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch Width (feet)	Ditch Depth (feet)	Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
				S	R	W	D		G1	G2	C1	C2	%	%
4000	0+00	80+00	B	18	12	3	1	4"	Rock Only					
Spur 100	0+00	30+89	C	15	10	2	1	4"	2	2	5	5	See 5.1-8	See 5.1-11
Spur 200	0+00	6+19	C	15	10	2	1	4"	2	2	5	5	See 5.1-8	See 5.1-11



ROCK LIST

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2				6 inch minus/Pit Run	L	H	T
*Spur 100	0+00	30+89	1 ½:1	6"	20	30.89	617.8	See contract Section 7	50	10	25
*Spur 200	0+00	6+19	1 ½:1	6"	20	6.19	123.8	See contract Section 7	50	10	25
Culvert inlets/outlets							2.0	Quarry Spalls			

BALLAST TOTAL 743.6Cubic Yards

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1	1 ¼ inch minus			
4000	0+00	16+00		8"	45	16	720	commercial
4000	35+00	38+50		8"	45	3.5	157.5	commercial
4000	58+00	62+00		8"	45	4	180	commercial

SURFACE TOTAL 1057.5 Cubic Yards

*Optional Rock: If Purchaser elects to haul on optional rock roads in wet weather, the depth listed above is recommended but not required.

NOTE: Yardages are estimated on a compacted (In-Place) basis. Compliance of required rock will be based on compacted depth measurement.

LEGEND

Optional Road

Powerline in Rd.

Title: Sale Area

Timbersale: Ulala (30-076003)

Date: 6/1/2004

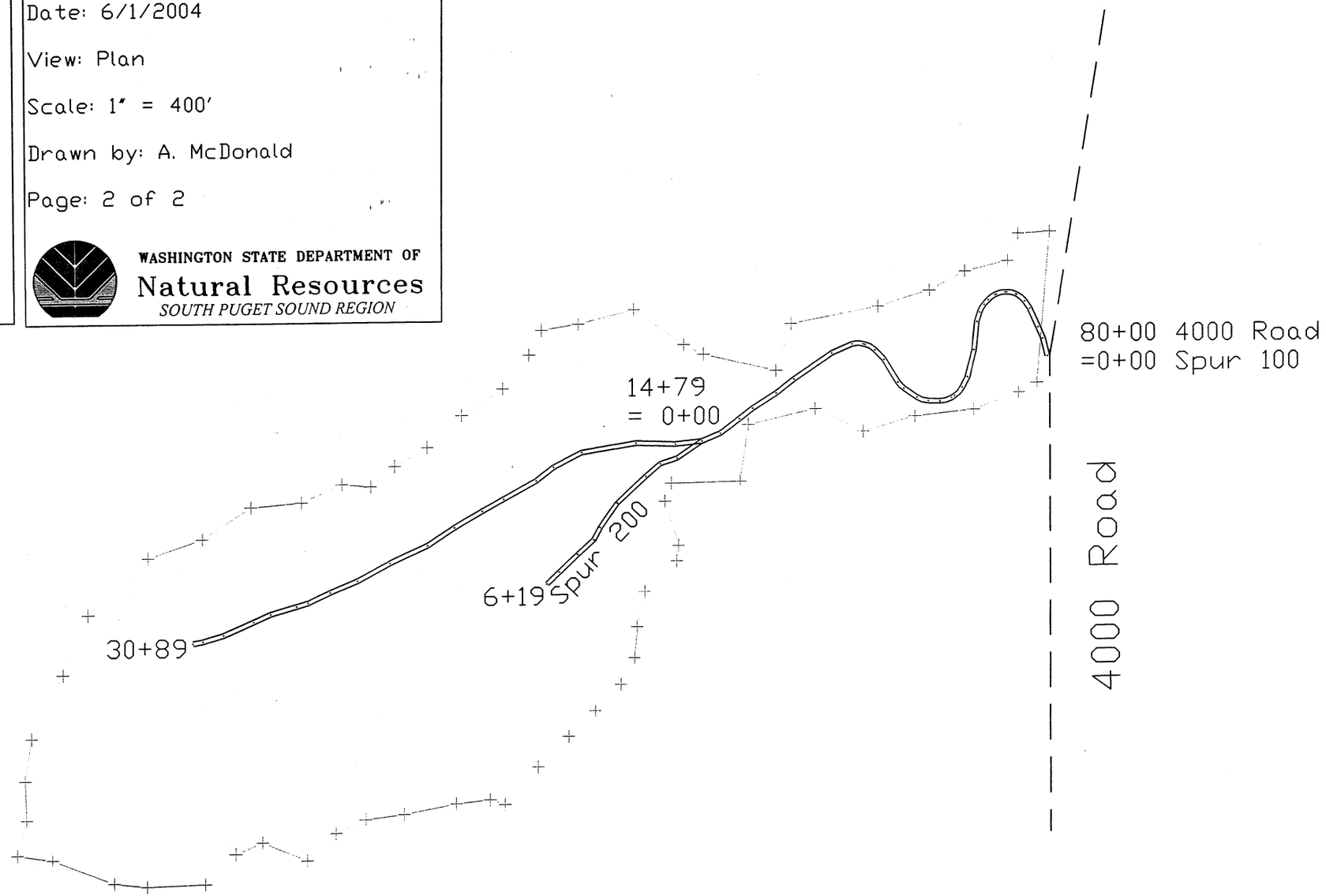
View: Plan

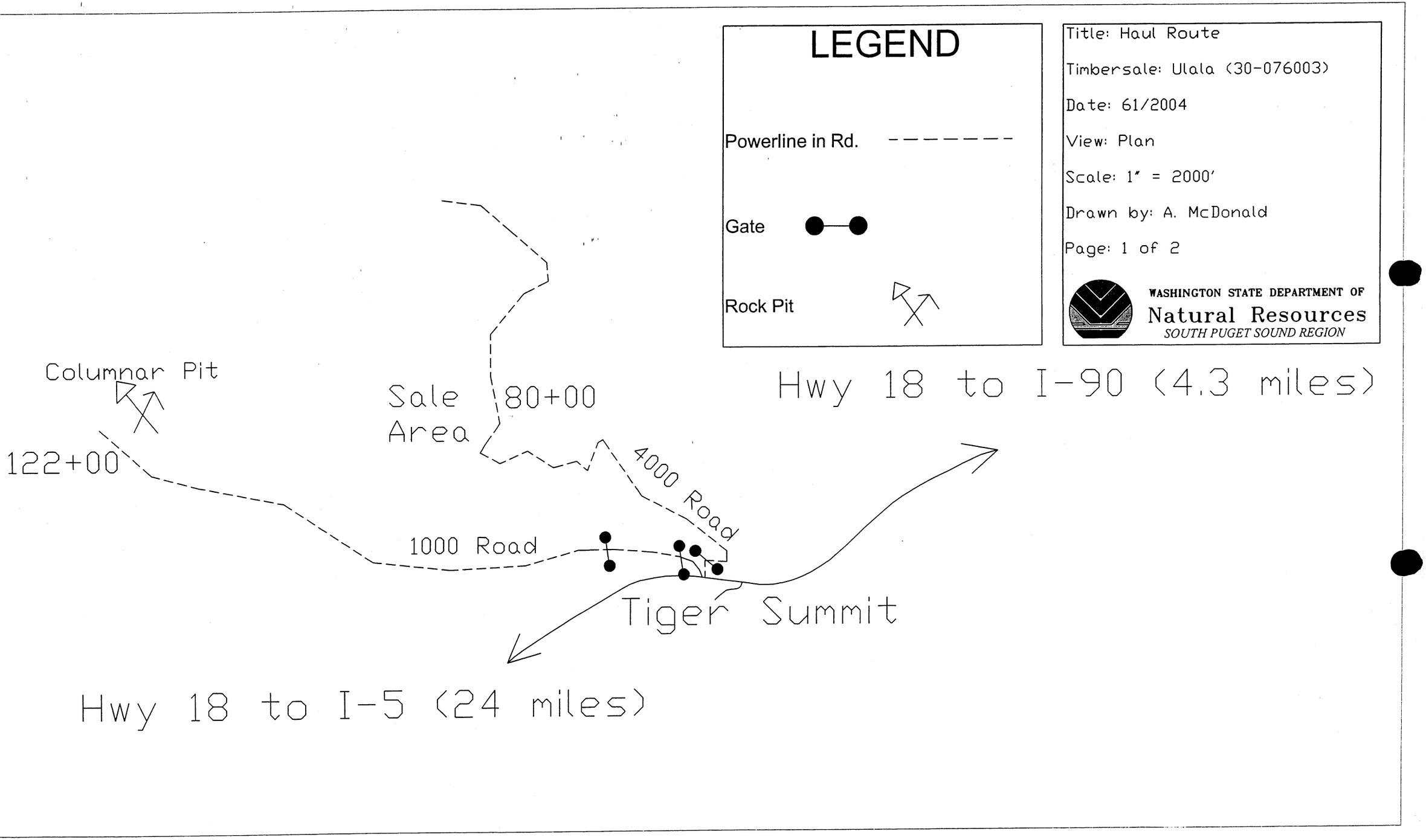
Scale: 1" = 400'

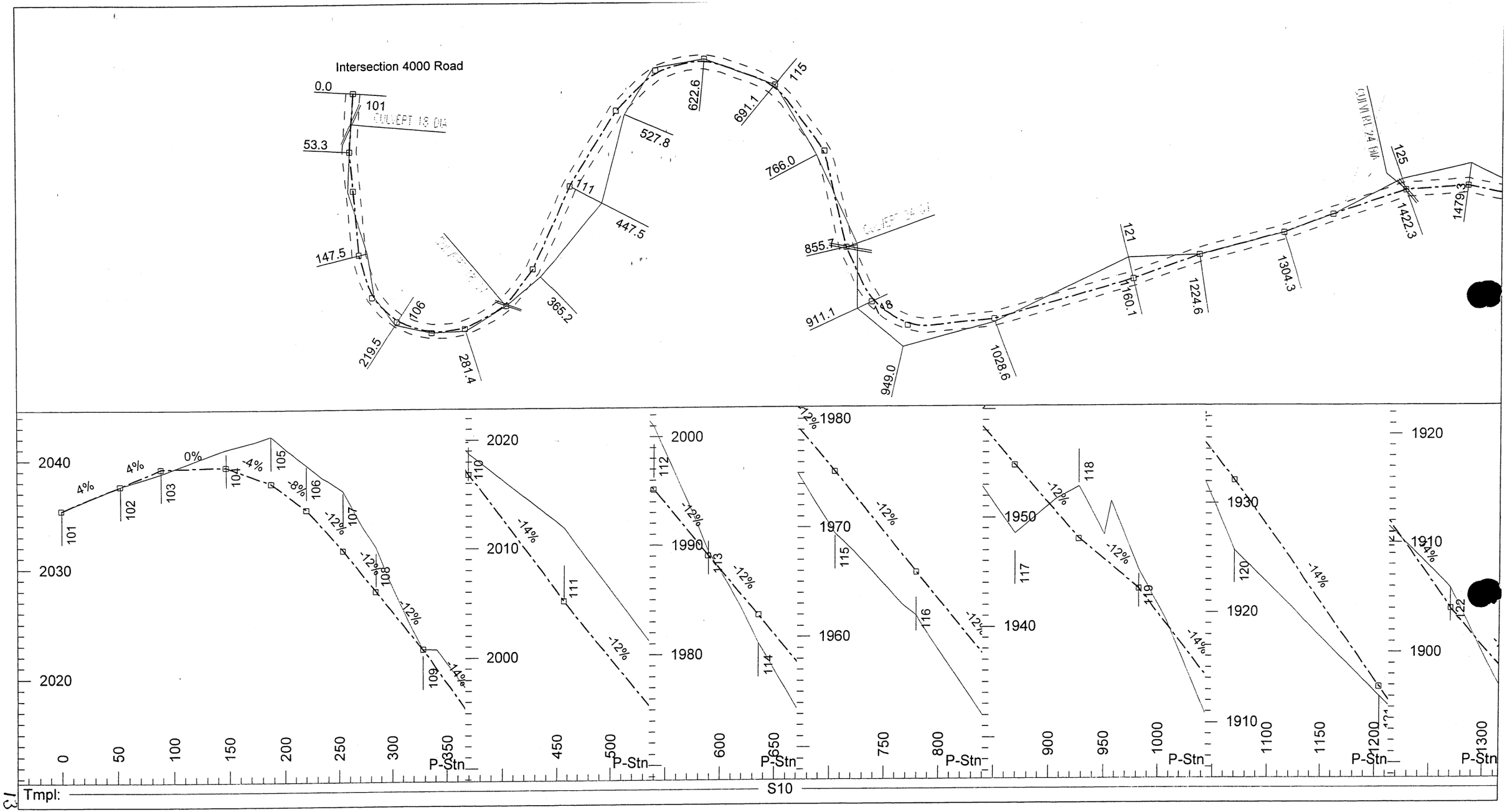
Drawn by: A. McDonald

Page: 2 of 2

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SOUTH PUGET SOUND REGION




LEGEND
Powerline in Rd.
Gate
Rock Pit
Title: Haul Route
Timbersale: Ulala (30-076003)
Date: 61/2004
View: Plan
Scale: 1" = 2000'
Drawn by: A. McDonald
Page: 1 of 2
WASHINGTON STATE DEPARTMENT OF
Natural Resources
SOUTH PUGET SOUND REGION
Columnar Pit
Sale Area
80+00
122+00
4000 Road
1000 Road
Tiger Summit
Hwy 18 to I-90 (4.3 miles)
Hwy 18 to I-5 (24 miles)



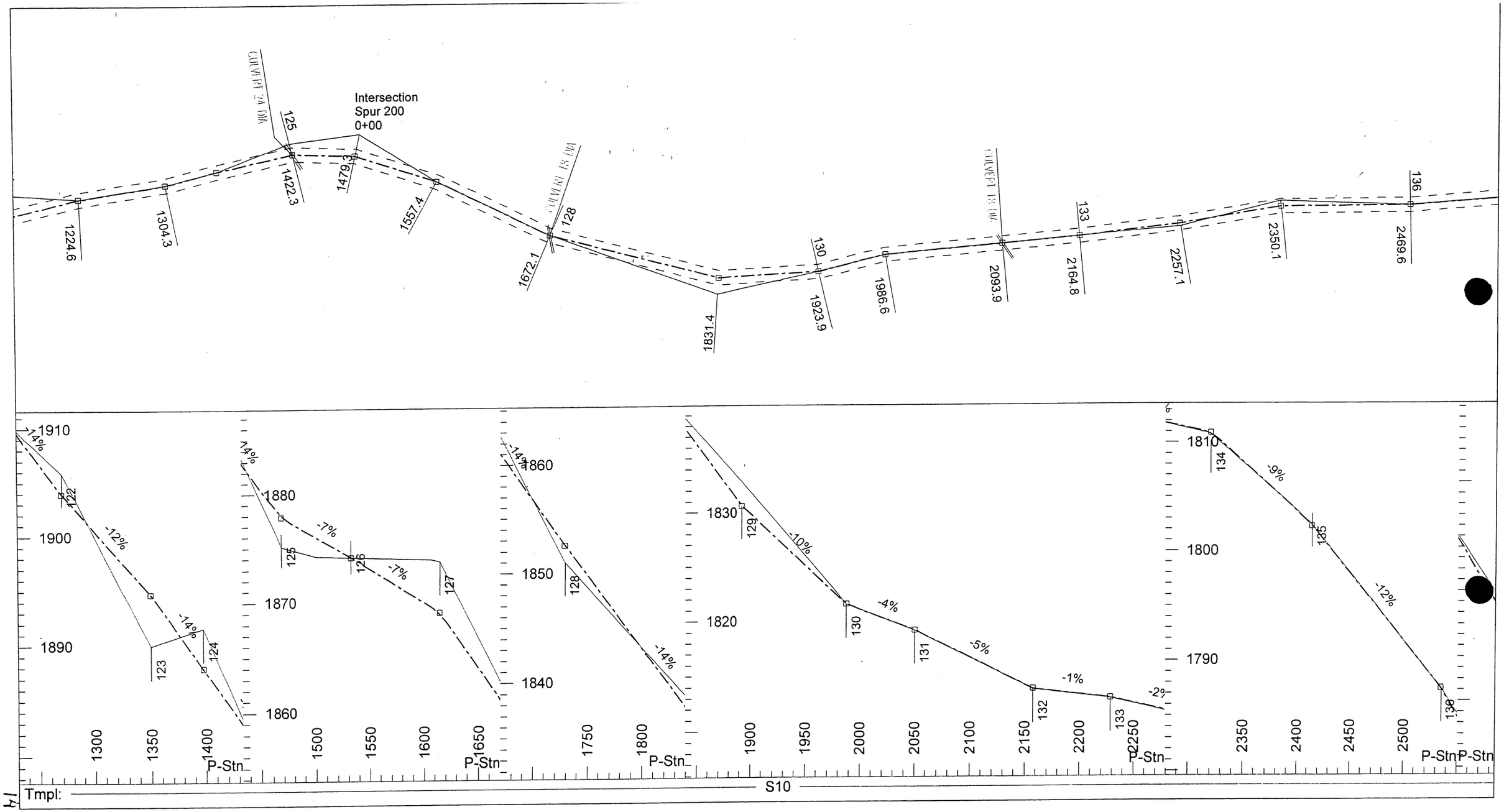
Washington State Department of Natural Resources
South Puget Sound Region

WASHINGTON STATE DEPARTMENT OF Natural Resources

Plan Scale 1:1200 Profile Vert Scale 1:120 Profile Horz Scale 1:1200	S10 = standard cross section	Engineer: A. McDonald Sale: Ulala (30-076003) Title: Spur 100

Date: 6/1/2004

13 of 23



Washington State Department of Natural Resources
South Puget Sound Region

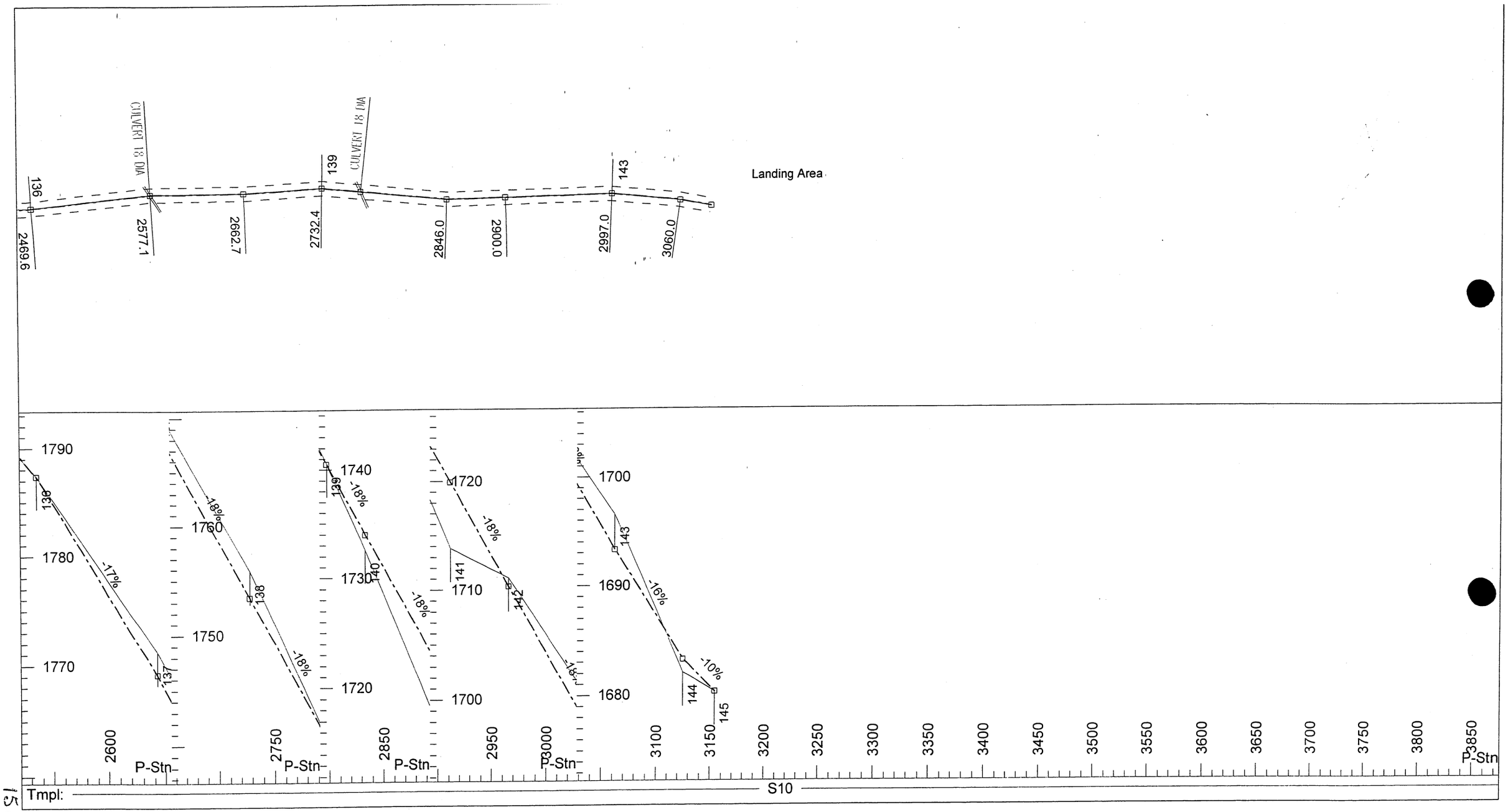
WASHINGTON STATE DEPARTMENT OF Natural Resources

Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

S10 = standard cross section

Engineer: A. McDonald
Sale: Ulala (30-076003)
Title: Spur 100

Date: 6/1/2004



15 of 23

Washington State Department of Natural Resources
South Puget Sound Region

WASHINGTON STATE DEPARTMENT OF Natural Resources

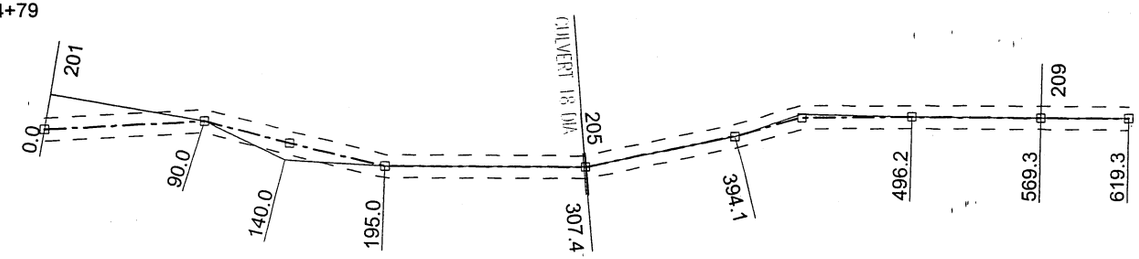
Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

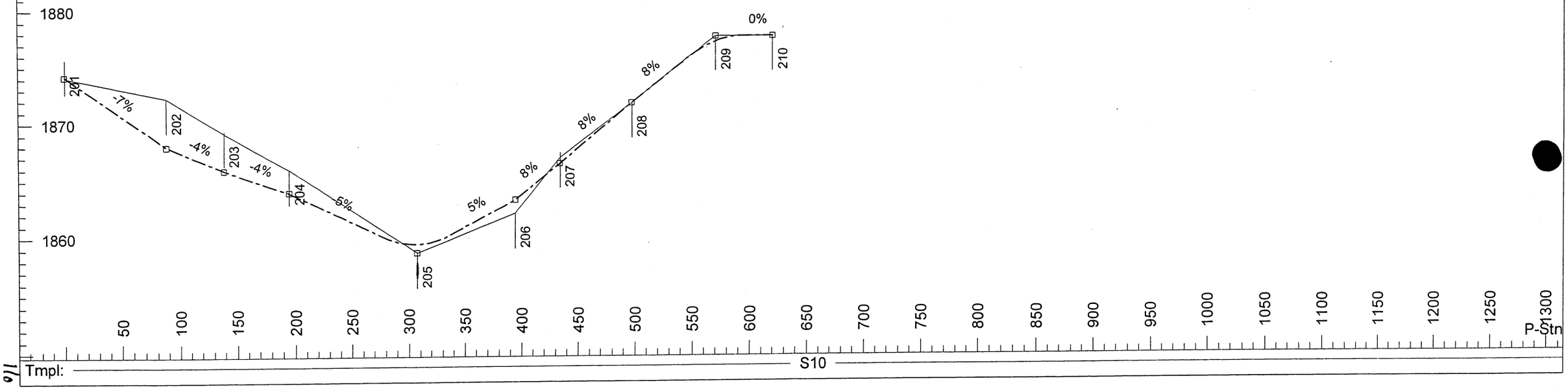
S10 = standard cross section

Engineer: A. McDonald
Sale: Ulala (30-076003)
Title: Spur 100

Date: 6/1/2004
Page 3 of 3

Intersection Spur 100
14+79





Washington State Department of Natural Resources
South Puget Sound Region

WASHINGTON STATE DEPARTMENT OF Natural Resources

Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

S10 = standard cross section

Engineer: A. McDonald
Sale: Ulala (30-076003)
Title: Spur 200

Date: 6/1/2004
Page 1 of 1

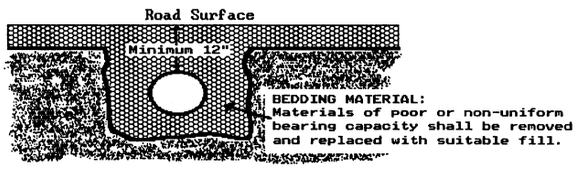
16 of 23

CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Type	Length (ft) Culvert	Downspt	Flume	Riprap (C.Y.) Inlet	Outlet	Type	Backfill Material	Placement Method	Const. Staked	Remarks
Spur 100	0+28	18"	TEMP	40'			0.1	0.1	QS				
	3+24	18"	TEMP	26'			0.1	0.1	QS				
	8+55	24"	TEMP	40'			0.1	0.1	QS				
	13+04	18"	TEMP	30'		5'	0.1	0.1	QS				
	14+22	24"	TEMP	28'			0.1	0.1	QS				Stream (NS)
	16+72	18"	TEMP	26'			0.1	0.1	QS				
	20+93	18"	TEMP	26'			0.1	0.1	QS				
	25+77	18"	TEMP	28'			0.1	0.1	QS				
	27+67	18"	TEMP	26'			0.1	0.1	QS				
Spur 200	3+07	18"	TEMP	26'			0.1	0.1	QS				

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S
GS16 = Galvanized Steel AASHTO No. M36, 16 Gauge
AS12 = Aluminized Steel AASHTO No. M274, 12 Gauge
TEMP = Temporary Culvert

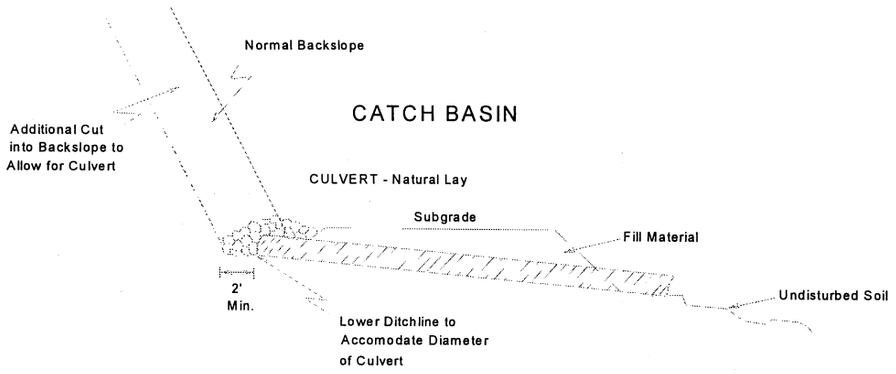
CULVERT BACKFILL AND BASE PREPARATION
(For culverts less than 36")

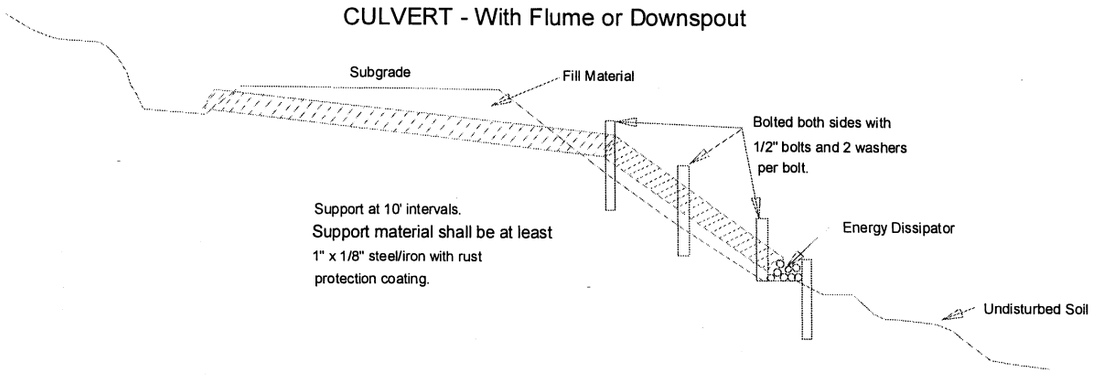


Key:

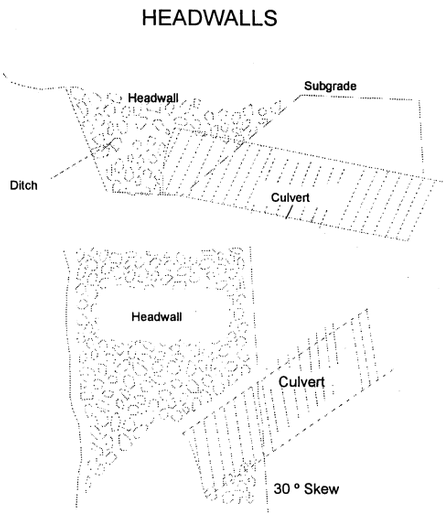
QS - Quarry Spalls
SR - Shot Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

CULVERT AND DRAINAGE SPECIFICATION DETAIL

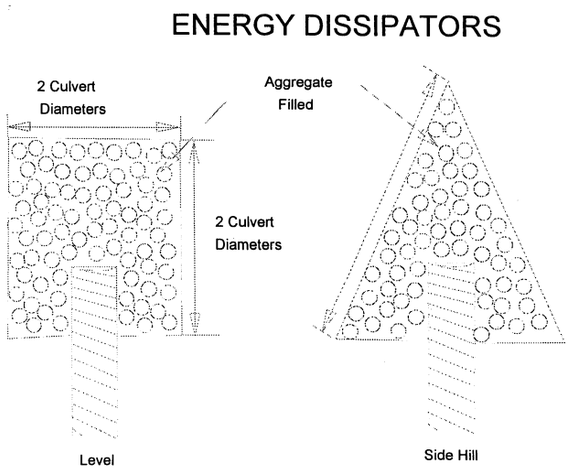




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

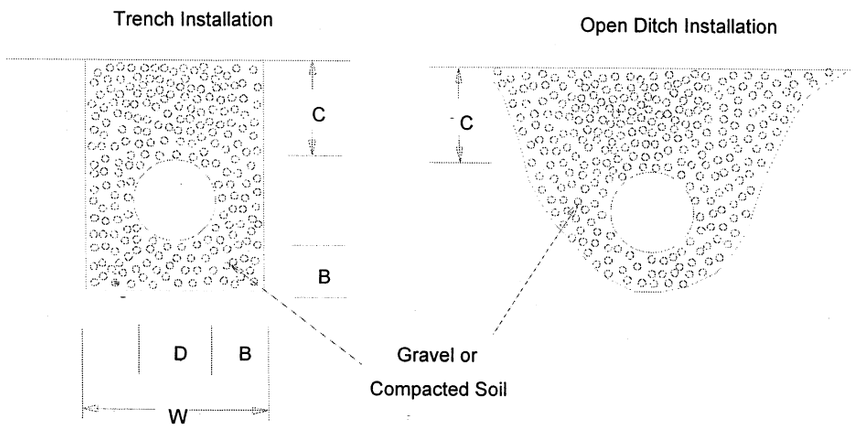
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS

Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1 ½ : 1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

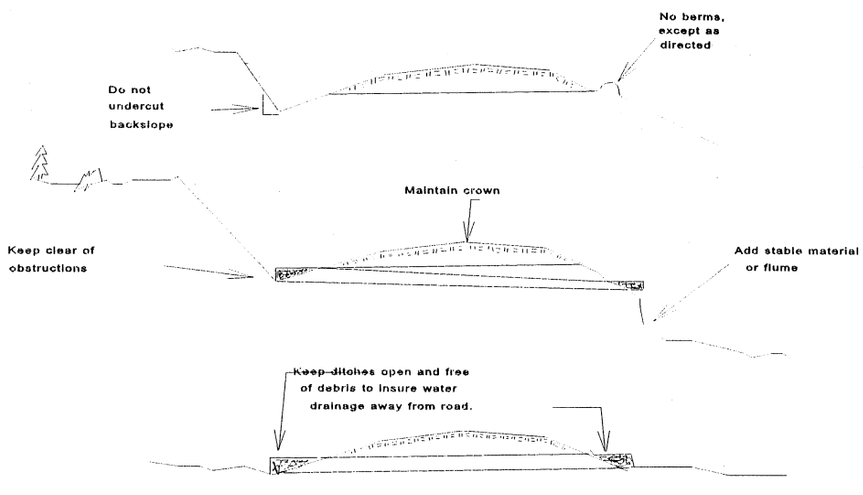
D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.

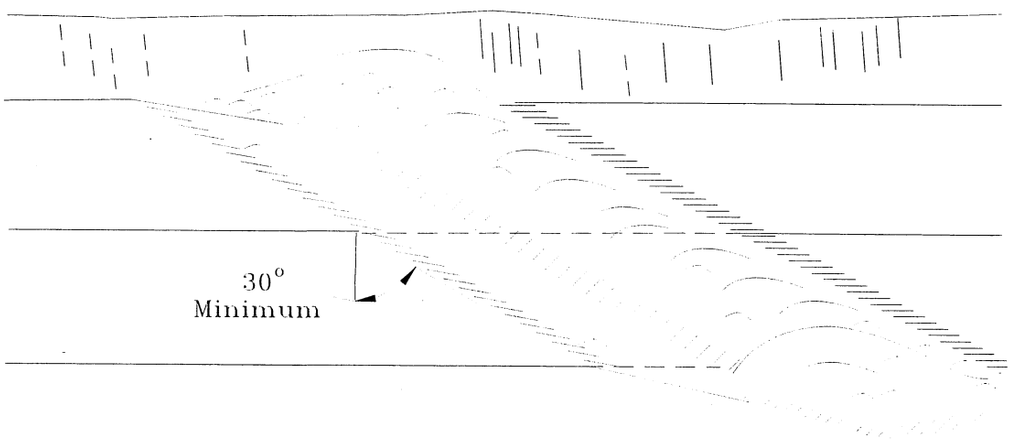
2. Existing Roads – Timber Sale, Operator Maintained
   A. Same as above but not to exceed the condition of the road on the date the contract was signed.

3. A.R.R.F. – Directed maintenance to comply with these specifications.

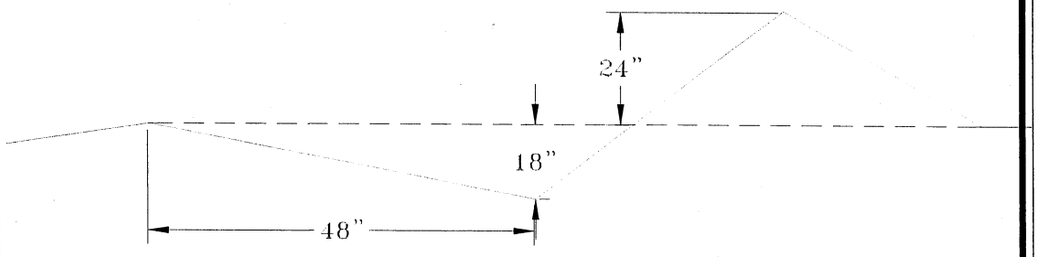


Non-Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



Water Bar Detail

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Scale : None
Drawn by: M.A.D.

Legal Description: NW ¼ of the NW ¼, SEC 19 T23N R07E

Rock Pit Name: Columnar Pit

PIT DEVELOPMENT AND RECLAMATION PLAN

1. Pile debris as directed by the Contract Administrator.

2. A minimum stripping width of 20 feet must be maintained from all pit faces and at the termination of operations pit shall be left in said condition.

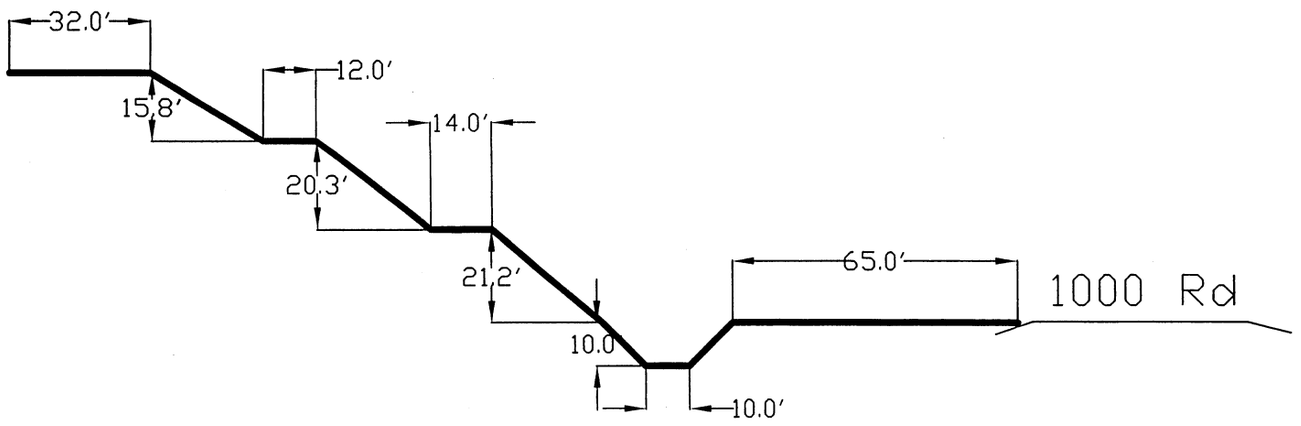
3. Pile all reject rock and overburden away from pit working area as shown or directed by the Contract Administrator.

4. Pit floor shall be sloped to allow drainage as shown. No ponding will be allowed.

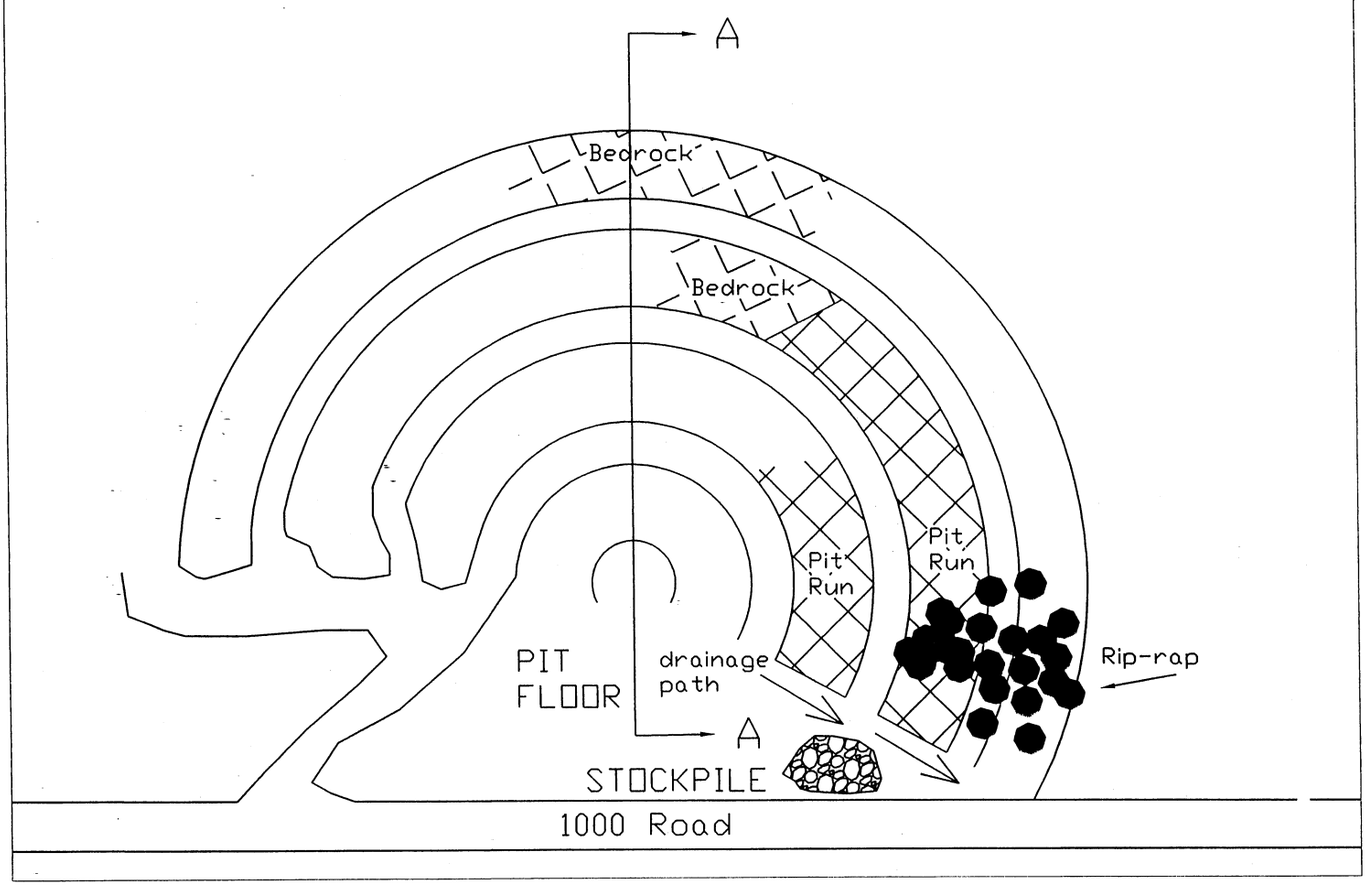
5. Maximum face height will be no greater than what can be reached by the excavating equipment.

6. At the termination of use the pit face shall have a maximum backslope of 1 ½ :1.

7. Quantity and Quality of ballast pit is not guaranteed by the State.



Section "AA"



Title: Development Plan
Columnar Pit

Timbersale: Ulala (30-076003)

Date: 6/1/2004

View: Plan/Profile

Scale: none

Drawn by: A. McDonald

Page: 1 of 1

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SOUTH PUGET SOUND REGION